



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification<sup>6</sup>:

H04Q 7/32

A1

(11) International Publication Number:

WO 97/44976

(43) International Publication Date: 27 November 1997 (27.11.97)

(21) International Application Number: PCT/US97/07402

(22) International Filing Date: 2 May 1997 (02.05.97)

(30) Priority Data:

08/646,166

7 May 1996 (07.05.96)

US

(71) Applicant: ERICSSON INC. [US/US]; 7001 Development Drive, P.O. Box 13969, Research Triangle Park, NC 27709 (US).

(72) Inventors: BOURGEOIS, Troy; 504 Samara Street, Apex, NC 27502 (US). LILJA, Patrik; 4145-204 Lake Lynn Drive, Raleigh, NC 27613 (US).

(74) Agents: MOORE, Stanley, R. et al.; Jenkins &amp; Gilchrist, P.C., Suite 3200, 1445 Ross Avenue, Dallas, TX 75202 (US).

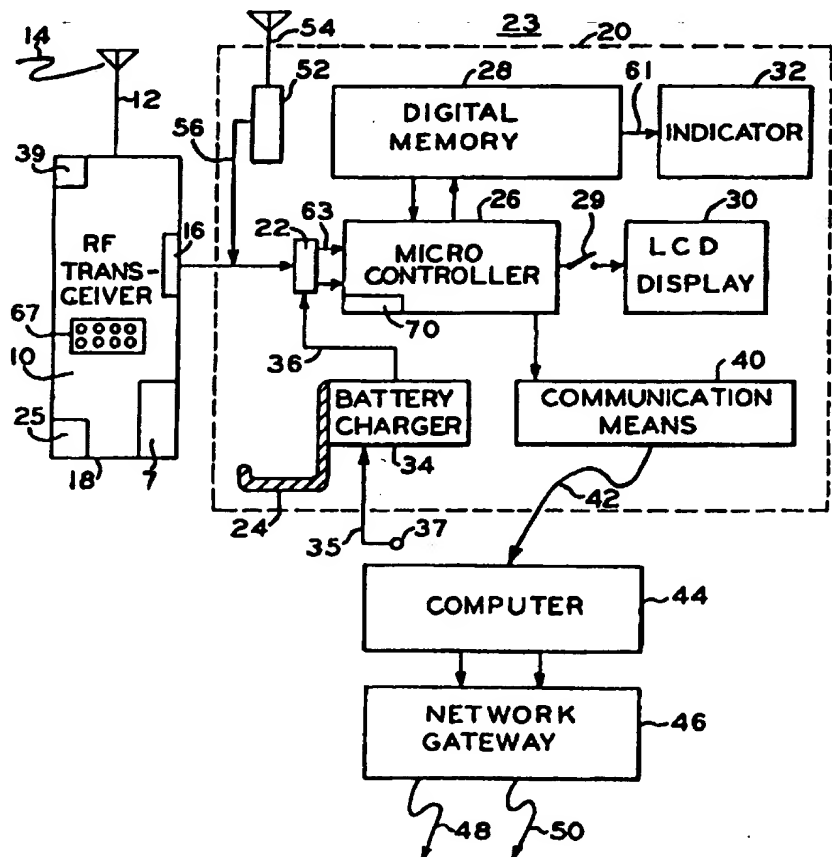
(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

**Published***With international search report.**Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*

(54) Title: INTELLIGENT DOCKING STATION FOR SHORT MESSAGE SERVICE

## (57) Abstract

A digital communication system with digital short message system text capability including a miniaturized transceiver and co-operating intelligent docking station which provides memory to store the received texts and for indication and selective display of the short message service texts plus additional external communication links to other networks.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakhstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

## INTELLIGENT DOCKING STATION FOR SHORT MESSAGE SERVICE

## BACKGROUND OF INVENTION

5        Personal use radio frequency (RF) transceivers such  
as cellular phones continue to decrease in size  
approaching cigarette-pack size for convenient carrying  
in shirt pockets. Small transceivers are severely limited  
in their capability to include physically large components  
such as occasional-use digital memory banks. At the same  
10      time transceivers are being designed to include short  
message service (SMS) message capability. SMS messages  
are transmitted text which can be transmitted digitally  
to portable digital wireless transceivers such as cellular  
telephones where the messages may be displayed on a liquid  
15      crystal display. A typical message may, for example,  
include instructions to call a particular customer  
telephone number or to call the office. This service  
enables the cellular phone to function as similar to a  
combination beeper and answering machine to record and  
20      later display brief messages transmitted in the absence  
of the user or while the user is otherwise occupied.  
While SMS has not yet become commercially available in the  
United States, it is part of the European Global System  
for Mobile Communication (GSM) and is the subject of  
25      interim industry standards IS-136 and IS-137 in the United  
States.

However, the diminishing size of portable  
transceivers, whether RF or infrared, presents a challenge  
regarding the inclusion of adequate memory capability to  
30      receive, record and playback on demand a number of  
recorded texts.

In addition to the problem of adding memory  
capability to transceivers being shrunk in size, it is  
also desirable to be able to add external communications  
35      means to facilitate communications to other networks  
through other communications links further compounding the  
size problem.

-2-

**OBJECTS OF SUMMARY AND INVENTION**

Accordingly, it is an object of the present invention to provide an improved added capability portable communications unit suitable for miniaturization.

5 It is another object of the present invention to provide an improved portable communication unit in which cooperating components are included in a cooperating docking station.

10 It is still another object of the present invention to provide an improved miniaturized digital portable communication system with expandable short message service capabilities.

15 It is yet another object of the present invention to provide an improved handheld miniaturized portable communication system with communications means which facilitate communications through multiple links.

In order to attain the above and other related objectives, in carrying out the present invention in one form thereof, a portable communication system with  
20 expandable short message service capabilities includes a portable digital wireless transceiver including short message service receiving capabilities and a cooperating intelligent docking station including means to interconnect the transceiver and the docking station for  
25 the storage in memory and subsequent selective displaying through the transceiver of a plurality of short message service texts received by the transceiver. The docking station may also include battery charging means for the battery in the transceiver and external communications  
30 means to communicate with other equipment through other types of communication links. The docking station includes means to support the interconnected transceiver on the docking station to receive short message service texts in the absence of a user for subsequent selective  
35 display with an indicator indicating the presence of stored texts.

**SUBSTITUTE SHEET (RULE 26)**

-3-

**BRIEF DESCRIPTION OF DRAWINGS**

FIG. 1 is a simplified block diagram showing a portable communication system incorporating the present invention.

5 Referring to FIG. 1, portable communication system 1 includes portable hand-held digital wireless transceiver 10 such as a cellular phone with a suitable antenna 12 for receiving radio frequency communications 14.

10 Intelligent docking station 20 includes an interface plug or connector 22 configured for mating with connector or female receptacle 16 on wireless transceiver 10 and cuplike holder 24 is configured to receive bottom 18 of transceiver 10 to secure the transceiver in place upon intelligent docking station 20 with mating electrical  
15 interconnections provided by receptacle 16 and connector 22. Micro-controller 26 within docking station 20 provides a means of providing short message service text received by transceiver 10 and provided through receptacle 16 and connector 22 to digital memory 28 to be selectively  
20 displayed on liquid crystal display (LCD) 30. An indicator 32 which may be an audible beep or other noise, or a visible indicator light (or a combination thereof) indicates that short message service text has been received and is stored in digital memory 28.

25 Battery charger 34 within docking station 20 receives input power 35 from a power source 37 which in the case of a vehicle such as an automobile may conveniently be the vehicle's battery. Direct current voltage 36 is provided from battery charger 34 through mating connectors 22 and  
30 16 to battery 7 within transceiver 10.

In operation, SMS digital texts when transmitted to RF transceiver 10 will in the absence of a receiving operator or user be stored through controller 26 and digital memory 28 with indicator 32 indicating the  
35 presence of stored texts messages. Actuation of switch 39 will display the stored texts on LCD display 30. Since the controller 26 and digital member 28 are included

**SUBSTITUTE SHEET (RULE 26)**

-4-

within intelligent docking station 20 there is no problem providing adequate capability and space to enable the reception and storage of a large number of SMS texts. This enables the size of transceiver 10 to be maintained in a miniature state suitable for carrying in a shirt pocket even though expanded capabilities such as SMS texts are added. Indicator 39 may be included in transceiver 10 to also show the presence SMS text in memory when the transceiver is removed from its cooperating position on docking station 20.

Docking station 20 utilizes cooperating vehicle antenna 54 to assist transceiver 10 in receiving and storing in digital memory 28 any messages transmitted while the transceiver is docked or connected to the docking station through lead 56 and connector 22 and receptacle 16. Receiver 52 may be included in docking station 20 and activated by lead or pin 56 upon the removal of transceiver 10 from docking station 20 to enable reception and recording of SMS messages received while transceiver 10 is carried or used outside of or away from the vehicle or office in which docking station 20 is located or installed.

The capabilities of communication system 1 of the present invention may be further expanded while nevertheless continuing to maintain or even shrink the size of portable transceiver 10 by use of communications means 40 within docking station 20 to communicate to a remote receiving means such as computer 44 by radio frequency or infrared transmission 42. Computer 44 may include network gateways 46 for further transmissions 48 and 50 through or to other networks and which may include wireless links or a local area network gateway router.

While the present short message service is directed at short text messages of 64-245 alphanumeric characters the expanded memory and display possible through use of the subject intelligent docking station enables expansion of the communication system and its capabilities to

SUBSTITUTE SHEET (RULE 26)

-5-

include voice mail or messages and fax mailboxes including analog operation and use and the use of a plurality of memory units 28 or the selection of a memory unit with suitable capability for the particular portable communication system 1.

The present invention is particularly suitable for installation in a vehicle such as an automobile wherein docking station 20 may conveniently be positioned on the console or otherwise installed within easy reach of the vehicle operator or operating position indicated generally as 23 to provide a convenient holder 24 for transceiver 10 along with battery charging power 36 plus the expanded communication capabilities as described above through interconnections 16 and 22 to electronics 26 and digital memory 28. Controller 26 and digital memory 28 and communication means 40 can conveniently be positioned remote from docking station 20 and connected by cabling to enable these components to be located outside of the docking station such as under the front seat of the vehicle in which portable communication system 1 is located. This will facilitate maintaining a small docking station 20 size and also enable the SMS message capability to be an optional plug in addition and/or retrofit feature to a standard docking station. External extension cabling such as 61 and 63 with appropriate end connectors would be used to selectively connect controller 26 and digital memory 28 and/or communication means 40 to docking station 20 which may conveniently be pre-wired with connecting plugs to accept the additional components. This facilitates and enables system flexibility and retrofitting utilizing the selective combination of a variety of plug-in modules or building blocks.

The present invention provides a multiplicity of features and solutions to problems including enabling the continuing miniaturizing of portable transceivers while enabling the addition of features and expansion of operational capabilities such as SMS and external

SUBSTITUTE SHEET (RULE 26)

-6-

communication capability. In addition, transceiver 10 is maintained in position on docking station 20 enabling hands-free use while providing the capabilities of antenna 54 which is normally more sensitive than miniaturized antenna 14 on the transceiver, and also providing power to recharge battery 7. This provides expanded capabilities and facilitates the use of portable communication system 1.

Micro controller 26 can be programmed to enable the utilization of keypad 67 on transceiver 10 to display on display 30 selected messages, such as those from the office, in advance of or to the exclusion of other messages in memory 28 or the uploading of selected stored messages. Alternatively, docking station 20 may include controls or keypad 70 for uploading and/or selective display of stored messages. Messages in memory 28 can be uploaded through connector 22 and receptacle 16 or through radio link or a antenna 54. While the speaker in transceiver 67 is suitable for use in hands free operation of the transceiver when position on docking station 20, the docking station could include a separate speaker. This could also be used to enable voice messages storage and playback and will enable the use of the system as a personal manager to record and retrieve personal information messages such as a list of "to do" items or meeting notices. Transceiver 10 may be operated while positioned on docking station 20 which may be facilitated by including voice actuated switch 25 which can be located on transceiver 10 and/or docking station 20. The present invention can also be utilized in an office environment in which docking station 20 is mounted on a desk in a conveniently accessible location with transceiver 10 available for portable use around the office or off-site. The invention is applicable to analog as well as digital communication systems.

While the present invention has been described with respect to certain preferred embodiments thereof, it is



-7-

to be understood that numerous variations in the details of construction, the arrangement and combination of parts, and the type of materials used may be made without departing from the spirit and scope of the invention.

5

SUBSTITUTE SHEET (RULE 26)

-8-

**WHAT WE CLAIM IS:**

1. A portable communication system with expandable short message service comprising:

a portable wireless transceiver;

5 a fixed intelligent docking station including means to selectively support said transceiver in a docked position and interconnect said transceiver and said docking station;

10 memory means connected to said docking station for storing and for display io of a plurality of said short message service texts received by said transceiver and provided to said docking station through the interconnection therebetween; and display means for selectively displaying the text of messages stored in said  
15 memory.

2. The communication system of claim 1 wherein said docking station includes an electronic digital memory to store a plurality of received short message service texts.  
20

3. The communication system of claim 2 wherein said docking station is adapted for mounting in a fixed position within a vehicle in proximity to the operating position of said vehicle and includes means for selective  
25 display of said stored short message texts.

4. The communication system of claim 3 including an indicator to indicate the presence of at least one short message system text stored within said digital  
30 memory and wherein said memory means is separated from and connected to said docking station.

5. The communication system of claim 4 wherein said indicator is on said transceiver.  
35

SUBSTITUTE SHEET (RULE 26)

-9-

6. The communication system of claim 2 wherein said system includes means to operate said transceiver while supported on said docking station.

5           7. The communication system of claim 6 wherein said means to operate said transceiver includes a voice actuated transmit-receive switch.

10           8. The communication system of claim 3 wherein said portable transceiver includes a first rechargeable battery for the powering thereof, and said docking station includes means to provide recharging power from a second battery in said vehicle to said first battery through said interconnection when said transceiver is positioned on  
15           said docking station.

          9. The communication system of claim 2 wherein said portable transceiver includes a keypad and said docking station includes a controller with means to control the  
20           display of selected messages within said memory means.

          10. The communication system of claim 9 further including means at said docking station for storing and subsequent selective display of information originated at  
25           said docking station.

          11. The communication system of claim 10 wherein said information includes voice stored messages.

30           12. The communication system of claim 10 wherein said information includes personal information messages.

          13. The communication system of claim 9 wherein said docking station further includes communication means for  
35           communication independent of said portable transceiver with units external to said transceiver and docking station.

SUBSTITUTE SHEET (RULE 26)

-10-

14. The communication system of claim 13 wherein said communication means includes an infrared transmission link to a remotely located computer which in turn interfaces to external independent communication links.

5

15. The communication system of claim 2 wherein said docking station further includes an antenna and a receiver for linking said receiver to said memory when said transceiver separated from said docking station to enable the storage of short message service texts during the separation.

10

16. The communication system of claim 2 further including means to upload selected information stored in said memory to said transceiver.

15

17. The communication system of claim 16 further including means at said docking station to place information into storage in said memory.

20

18. The communication system of claim 16 further including means to select the type of information from that in said memory for display.

SUBSTITUTE SHEET (RULE 26)

1/1

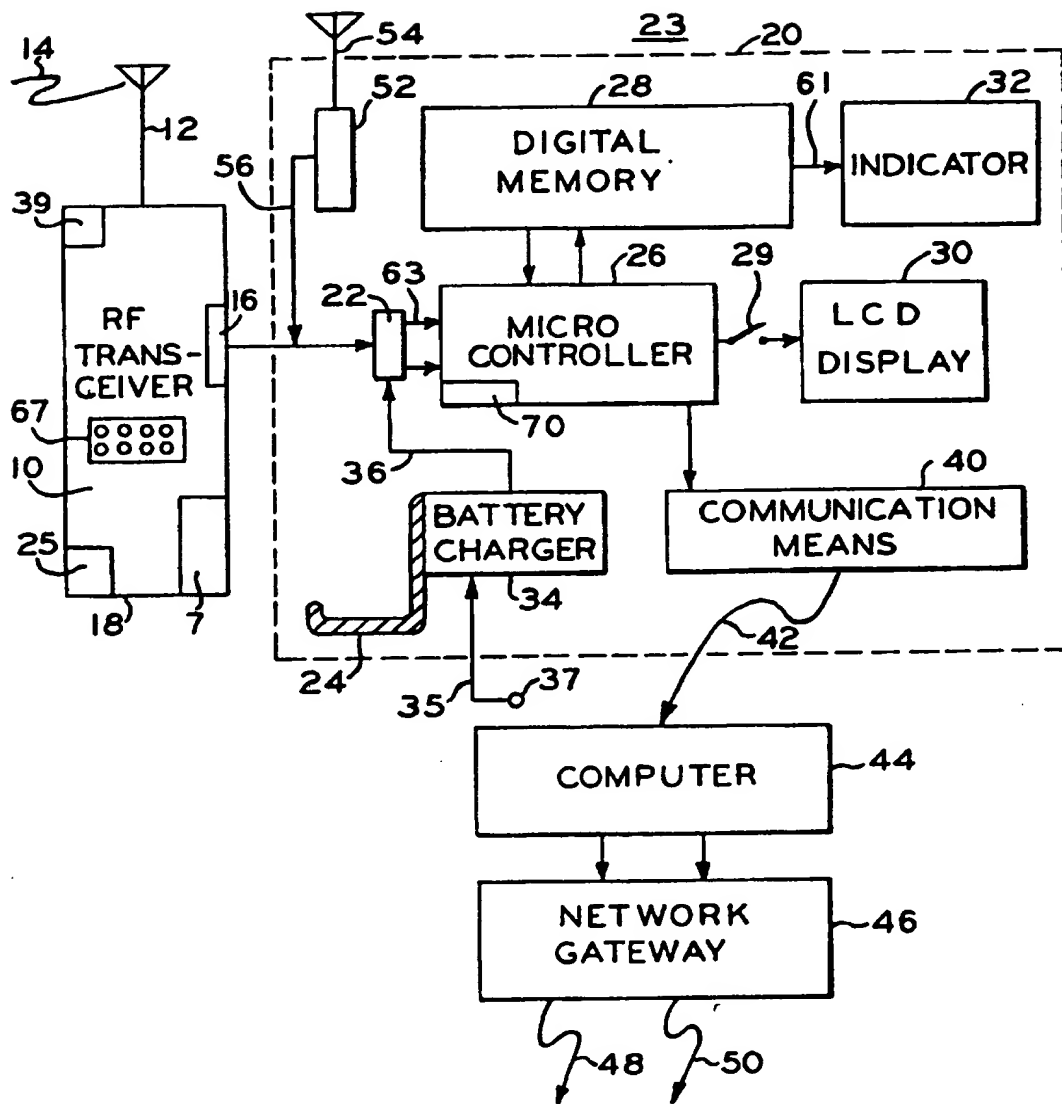


FIG. 1

SUBSTITUTE SHEET (RULE 26)

# INTERNATIONAL SEARCH REPORT

Intern. Appl. No.

PCT/US 97/07402

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 H04Q7/32

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 H04Q H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 645 941 A (SEL ALCATEL AG ;ALCATEL NV (NL)) 29 March 1995	1,2,9, 10, 12-14, 16-18 3,6,8
A	see column 2, line 6 - line 21 see column 2, line 27 - line 38 see column 2, line 43 - line 54 see column 3, line 25 - line 44 see column 4, line 9 - line 18 see column 4, line 42 - column 5, line 22 see column 6, line 11 - line 25 --- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Z\* document member of the same patent family

Date of the actual completion of the international search

15 October 1997

Date of mailing of the international search report

29.10.1997

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Gerling, J.C.J.

# INTERNATIONAL SEARCH REPORT

Inter. Nat Application No

PCT/US 97/07402

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KING J ET AL: "HOLSTER WITH SECONDARY LCD AND ELECTRONICS USED TO STORE AND/OR DISPLAY MESSAGES" MOTOROLA TECHNICAL DEVELOPMENTS, vol. 11, SCHAUMBURG (US), page 137 XP000178667 see the whole document	1,2,9, 10,12, 13,16,18
Y	GB 2 264 613 A (PIONEER ELECTRONIC CORP) 1 September 1993	1,2,9, 13,14, 16-18
A	see page 2, line 7 - line 23  see page 3, line 3 - line 10 see page 5, line 8 - page 6, line 6 see page 6, line 16 - page 7, line 9 see page 7, line 18 - line 23 see page 8, line 14 - line 22 see page 11, line 16 - page 13, line 24 see page 22, line 2 - line 7 see page 23, line 13 - page 24, line 3	3,4,6, 10-12,15
A	WO 95 06996 A (ERICSSON GE MOBILE COMMUNICAT) 9 March 1995  see page 3, line 20 - page 4, line 22 see page 6, line 1 - line 4 see page 7, line 1 - line 13 see page 7, line 20 - line 23 see page 8, line 9 - page 10, line 8 see page 10, line 14 - line 17 see page 12, line 14 - line 19 see table 1	1,2,4,5, 9,10,12, 16-18
A	DE 43 40 679 A (DETECON DEUTSCHE TELEPOST CONS) 1 June 1995	
A	GB 2 289 555 A (NOKIA MOBILE PHONES LTD) 22 November 1995	
A	GB 2 290 007 A (NIPPON ELECTRIC CO) 6 December 1995	
A	PATENT ABSTRACTS OF JAPAN vol. 016, no. 215 (E-1204), 20 May 1992 & JP 04 035321 A (MATSUSHITA ELECTRIC WORKS LTD), 6 February 1992, see abstract	

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Interr. Application No

PCT/US 97/07402

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0645941 A	29-03-95	DE 4332758 A	30-03-95
GB 2264613 A	01-09-93	NONE	
WO 9506996 A	09-03-95	CN 1114125 A	27-12-95
		DE 4496561 T	21-09-95
		DK 50395 A	27-04-95
		FI 952061 A	28-04-95
		FR 2709625 A	10-03-95
		GB 2286507 A	16-08-95
		JP 8505747 T	18-06-96
		SE 9501463 A	15-06-95
DE 4340679 A	01-06-95	NONE	
GB 2289555 A	22-11-95	FI 942334 A	20-11-95
GB 2290007 A	06-12-95	JP 7327089 A	12-12-95
		AU 2038095 A	07-12-95
		CA 2150290 A	01-12-95
		CN 1122083 A	08-05-96
		US 5566226 A	15-10-96